Window into a Green Virginia

I. Curriculum Overview

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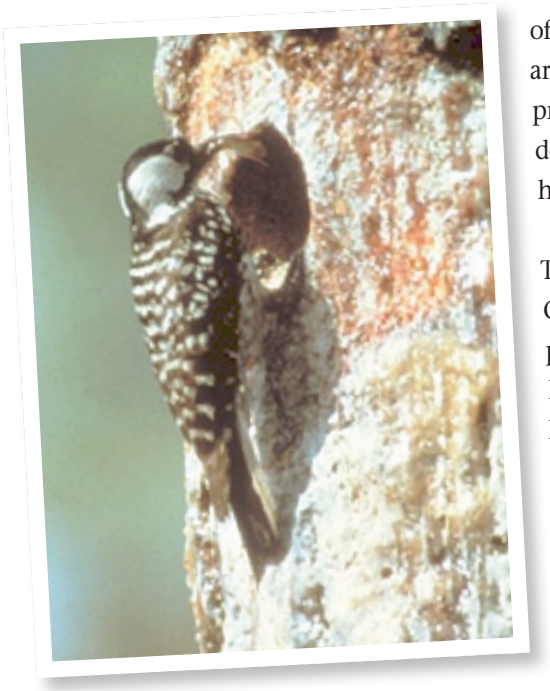
1.1 Introduction

In June of 2004, fire was intentionally set to 125 acres of forest underbrush in Piney Grove Reserve 55 miles from Richmond, Virginia, to make the habitat more suitable for the Red-cockaded Woodpecker (RCW). This rare bird was placed on the Federal Register of Endangered Species in October of 1970, and is also on Virginia's endangered species list. (Springston, R., "Conservationists Torch Trees to Benefit a Rare Woodpecker," *The Roanoke Times,* 6-24-04, V-4). The preferred habitat of the Red-cockaded woodpecker is 80-120 year old open pine stands. Longleaf pines are most common but other Southern pine species are acceptable. Dense stands of primarily hardwood or stands with a thick hardwood understory are avoided. The decline in population of this bird (common before 1850) is due to the loss of preferred habitat as a result of fire suppression.



The aim by conservationists with the Nature Conservancy (owners of the Piney Grove Reserve) is to restore that part of Piney Grove's 2,700 total acres to an open pine savanna ecosystem once common throughout the Southeast U.S. One of the last habitats of this beautiful bird, Virginia is home to 21 adult RCWs with nine hungry nestlings. Only three of the adults are breeding females. Indeed, the RCW is a fragile species teetering on extinction!

"Fire helps create open, park-like conditions beneath the canopy pines, allowing sunlight to reach forest-floor plants that support ants and other insects, the birds' prey base. Fire is as natural a part of this system as air and water."

Conservancy Ecologist Brian van Eerden.

This real-life situation is a dramatic example of the four principles contained in Virginia's Science Standard of Learning (SOL) 6.9 – Resources:

- ***Renewable Resources –*** the RCW (barely) and forest (slowly) are physically replenishable over time;
- ***Non-Renewable Resources –*** not harvesting (by preserving or burning) trees in a forest means that we must reduce consumption of lumber products and/or use more non-replenishable substitutes (e.g., iron ore, fossil fuels) for steel building materials and energy sources, respectively;
- ***Land Use Planning and Natural Hazards –*** setting aside land in wildlife refuges and forest reserves reduces the quantity and quality of remaining area available for human use, plus natural disasters complicate matters by destroying trees and altering the accessible landscape, as Hurricane Isabel did to Piney Grove in September 2003;
- C***ost/Benefit Analysis in Addressing Environmental Trade-Offs –*** the real issue is not whether to save the RCW (or Bald Eagle, Grizzly Bear or Tiger), but how many and at what cost? What if it required 500 or 1,000 or 5,000 acres to save the 30 RCW in Virginia, or 50 or 100 or 500 RCWs? Where is the optimal level of investment, i.e., the break-even point between marginal benefits and marginal costs per bird saved?

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1.2 Outline of Curriculum

This curriculum addresses Virginia's Science SOL's with emphasis on 6.9 – Resources, and includes cross references to other Mathematics and Social Studies SOLs. Students are invited to peer through metaphorical *Windows on the World* to examine key dimensions of developing sustainable communities.

Window

IV. Energy
V. Water
VI. Air
VII. Agriculture
VIII. Forestry and Wildlife
IX. Land Use and Natural Hazards
X. Birth of a Green Building
XI. Culminating Activity

Structure of each Window

Introduction, Objectives, SOLs
Key Terms/Concepts, Supplies Needed
Student Information Sheet
Teacher Content Section
Classroom Activities
Enrichment
Assessment
References

Each of the Windows is a stand-alone unit with which a teacher can help cover SOL 6.9. Plus, the curriculum culminates with an optional practical classroom exercise that integrates principles and insights from all seven Windows. Each of the Windows addresses SOL 6.9 with scientific content, case studies and current examples, policy analysis, teaching activities, and linkages to sources of enrichment. The goal is to present a sound, balanced, and integrated exploration of the sustainable management of natural resources to help Virginia's sixth graders develop into reasoned and informed citizens and leaders.

Standard 6.9 - Resources

The student will investigate and understand public policy decisions relating to the environment. Key concepts include:

a. Management of renewable resources (water, air, soil, plant life, animal life);
b. Management of nonrenewable resources (coal, oil, natural gas, nuclear power, mineral resources);
c. Mitigation of land-use and environmental hazards through preventive measures; and,
d. Cost/Benefit tradeoffs in conservation policies.